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Indian Standard

**GLOSSARY OF TERMS
RELATING TO OIL EXPELLERS**

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INDIAN STANDARDS INSTITUTION
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Indian Standard

GLOSSARY OF TERMS RELATING TO OIL EXPELLERS

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GLOSSARY OF TERMS RELATING TO OIL EXPELLERS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 April 1968, after the draft finalized by the Oil Expellers and Allied Oil Mill Machinery Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 This standard has been prepared for the guidance of manufacturers and users to assist them in the correct interpretation of the common terms used in oil expeller industry. It is hoped that this standard will help in establishing a generally recognized usage and eliminate ambiguity and confusion arising out of individual interpretation of terms used in the industry.

0.3 Figures given after the definitions are solely for the purpose of identifying the various parts of an expeller.

1. SCOPE

1.1 This standard gives the definitions of terms used in oil expeller trade. The assembly of various parts of the oil expeller defined in this standard is illustrated in Fig. 1 and 2.

2. TERMINOLOGY

2.1 Agitator—An assembly of steel blades mounted on a central shaft and rotating in long heating kettles. The blades agitate and push the cooked seed towards the hopper. Agitation avoids the buning or over-heating of the seed.

2.2 Barrel—*See* 'Chamber'.

2.3 Barrel Ring—*See* 'Chamber plate'.

2.4 Bearing—A support or carrier of a rotating shaft.

2.5 Bevel Gear—A gear pair used for transmitting power, whose axes intersect approximately at right angles, used in end driven expellers and kettles.

2.6 Body—The cast or fabricated frame of the expeller.

2.7 Cage—*See* 'Chamber'.

2.8 Cage Bar—A steel bar usually of rectangular cross-section and sometimes chamfered, fitted inside the chamber so as to provide slit gaps for the expelled oil to drain out. Slide and centre bars screwed to chamber bars give support to cage bars.

2.9 Cage Bar Set—The entire fitting of the chamber consisting of cage bars, taper bars, side bars, centre bars and spacers.

2.10 Centre Bar—A steel bar of trapezoidal cross-section fastened on the chamber bar in the centre of 'half' of a chamber. Usually three centre bars cover the entire length of the chamber. They facilitate the filling of cage bars in the chamber.

2.11 Chamber (Cage or Barrel)—The enclosure within which the worm assembly works, consisting of two chamber 'halves' assembled by chamber bars, chamber plates, centre bars, side bars, cage bars and screws. Two halves of the chamber placed in their position and fastened by clamping bars and chamber bolts, form a hollow cylinder within which the worm assembly works.

2.12 Frame Bar (Chamber Bar)—A bar of square cross-section to which chamber plates are fixed in their position to make 'half' of a chamber.

2.13 Chamber Bolt (Clamping Bolt)—Bolts (25 to 37 mm dia) used to keep the two halves of chamber in position with the help of clamping bars. They pass through the gaps between the chamber plates.

2.14 Chamber Plate (Barrelled Ring Half)—Plates suitably cut into shape to provide support to frame bars, centre bars, side bars and cage bars in forming a semicircular chamber. They provide space to clamping bars on the outside.

2.15 Chamber Screw—Cheese head screws used for fastening frame bars to chamber plates.

2.16 Clamping Bolt—*See* 'Chamber bolt'.

2.17 Collar—A ring formed on a shaft, either by forging integrally or made as a separate casting or forging, bored or turned, and held in a place with a set-screw or a split pin.

2.18 Cone (Pressure Cone or Cone Point)—A hollow truncated cone fitted on the cone head. The annular space between the cone and cone collar is controlled by its linear movement.

2.19 Cone Base — *See* 'Cone head'.

2.20 Cone Bush (Sleeve) — A spacing collar between the sleeve and the pressing worm.

2.21 Cone Collar (Discharge Collar or Discharge Ring) — A ring shaped member fixed in the cone body on which the chamber rests. It is generally in two pieces with a tapered bore forming an annular space with the cone, through which the cake discharges.

2.22 Cone Driving Pinion — A pinion with clutches on both sides loose fitted on cone driving shaft, and in teeth with cone gear. It can be clutched with the expeller body to stop rotation or with cone driving shaft to increase rotation.

2.23 Cone Driving Shaft — It is fitted with a clutch and has a speed about double that of the main shaft. Cone driving pinion can be clutched with it.

2.24 Cone Gear — A gear fitted on sleeve nut, in teeth with the cone driving pinion and generally in two parts. At normal position this gear has the same speed as cone shaft. By giving a higher or lower speed to this gear with the help of cone driving pinion, the whole assembly of cone, cone head and sleeve nut is caused to move in or out in order to adjust the position of the cone.

2.25 Cone Head — A mild steel member, keyed with the sleeve, screwed with the cone and fastened loose to sleeve nut with the help of cone head collar. Its function is to hold the cone in position and to transmit only the linear motion of the sleeve nut to the cone.

2.26 Cone Head Collar (Ring for Cone Base) — A ring shaped member used to clamp the cone head and sleeve nut loosely. It is generally in two pieces.

2.27 Cone Point — *See* 'Cone'.

2.28 Dead Clutch — A clutch fixed to the expeller body. By clutching the cone driving pinion to it the rotation of cone assembly stops.

2.29 Discharge Collar — *See* 'Cone collar'.

2.30 Distance Collar — *See* 'Spacing collar'.

2.31 Double Gear Drive — *See* also 'Main shaft gears'.

2.32 Driving Pulley — A plain or V-grooved pulley made of cast iron or mild steel fitted on the driving shaft.

2.33 Driving Shaft — *See* 'Side shaft'.

2.34 Driving Sleeve — *See* 'Gudgeon'.

2.35 Fan (Stirrer) — Cast iron or steel member with blades used in round kettle for stirring and sweeping the feed towards the outlet.

2.36 Feed-Hopper — The hopper through which the feed passes from the kettle to the expeller feed chamber. A vertical push worm is provided in some models.

2.37 Feed Worm — *See* 'Quill worm'.

2.38 Frame Bar — *See* 'Chamber bar'.

2.39 Gear — A toothed member designed to transmit or receive motion by successively engaging teeth with another gear.

2.40 Gudgeon — In single drive expeller, gudgeon carries the main shaft gear and is keyed to the main shaft and revolves inside the bearings of bodies No. 1 and 2. It also acts as a pivot to transfer the thrust of main shaft to the thrust bearing.

2.40.1 In double drive expeller it carries the quill worm gear and quill worm is screwed to it. It bears in the body No. 2 and on the main shaft.

2.41 Kettle — Kettle may be long and round. In medium and large kettles a steam jacket is provided for cooking the feed. The fan or agitator working in the kettle pushes the feed towards the outlet.

2.42 Key Bar — *See* 'Centre bar'.

2.43 Knife Bar — Mild steel flat with projections to scrap the material collected around the spacing and taper collars. In one chamber two knife bars are fitted at the joining line of the two chamber halves.

2.44 Main Shaft (Worm Shaft) — A round shaft of steel to which are keyed worm assembly, gudgeon, pivot and sleeve. It rotates in bearings fitted in the body. It may be hollow for passing coolant to control the temperature.

2.45 Main Shaft Gears — Gears mounted on the main shaft directly or on a gudgeon for reducing the number of revolutions. Single drive expellers have one gear and double drive expellers two gears—one for the quill worm and the other for main shaft.

2.46 Oil Pan — *See* 'Tray'.

2.47 Pinion — One of the two gears in a pair which has the smaller number of teeth.

2.48 Pivot — A steel member used in double gear expellers, fitted on the main shaft near the driving end. It takes the thrust of the main shaft and transfers it to the main thrust bearing.

2.49 Pressing Worm — A steel worm with a helical thread on its length equal to one revolution and mounted on the main shaft in the chamber. It pushes the feed ahead towards the cone head. The setting of the worm assembly differs with the expeller and the type of seed to be crushed.

2.50 Pressure Cone — See 'Cone'.

2.51 Push Worm — A vertical worm arranged in feed hopper to push meal coming from the cooking kettle to the expeller.

2.52 Quill Worm (Feed Worm) — A member having a helical thread running throughout its length which receives the feed from the hopper and pushes it to the pressing worm assembly. Quill worm is longer than the pressing worm.

2.53 Reverse Worm — A pressing worm with reverse thread. The thread of the helix winds away in clockwise direction. It is used, occasionally, between pressing worms to increase pressure on the meal.

2.54 Ring for Cone Base — See 'Cone head collar'.

2.55 Screw — See 'Sleeve'.

2.56 Screw Nut — See 'Sleeve nut'.

2.57 Shaft — A spindle which revolves in bearings and carries pulleys or gears for transmission of power.

2.58 Shaft Clutch — A clutch keyed to cone driving shaft. Cone driving pinion can be clutched to it.

2.59 Side Bar (Shoe Bar) — A steel bar with Projection on side, which is sometimes tapered. The side bars are fitted on the frame bar lengthwise on both the sides of the chamber halves to provide support for cage bars.

2.60 Side Stand — A stand with a bearing block to support the rotating shaft.

2.61 Side Shaft (Driving Shaft) — A shaft on which are mounted the drive pulleys and the pinion. The pinion mates with the gear of the main shaft. It is supported by side stand, and side brackets fixed to the body.

2.62 Single Gear Drive Expeller — See also 'Main shaft gear'.

2.63 Sleeve — A hollow cylinder threaded on the outside and fixed on the main shaft with the key. It rotates with the main shaft.

2.64 Sleeve Nut — A threaded member made of steel or cast iron fastened to the cone through cone head, which can be made to move forwards or backwards on the sleeve for adjusting the position of the cone.

2.65 Spacers — Mild steel strips ranging from 0.25 to 0.63 mm in thickness inserted between unchamfered cage bars to provide slit gaps.

2.66 Spacing Collar (Distance Collar)—A collar used to space the worms.

2.67 Stand—The cast iron frame used to raise the level of the expeller from the ground. Stands are fixed to the floor with the help of foundation or anchor bolts.

2.68 Stirrer—*See* 'Fan'.

2.69 Taper Bar—A cage bar with a taper on one or both sides used for fixing cage bars in proper position.

2.70 Taper Collar—A collar which tapers to join two worms of varying diameters and also serves as a spacing collar for the generation of pressure.

2.71 Thrust Bearing—Specially designed bearing to take tangential load.

2.72 Tie Rod—A round bar threaded at both ends and used in connecting all the bodies and for tying them in their positions.

2.73 Tray—The cast iron tray attached to the body below the chamber. The expressed oil collects into the tray and flows down to the outlet hole.

2.74 Worm—A form of helical gear consisting of a continuous screw thread wrapped around a cylinder which continuously engages a segment of helix of the worm wheel.

2.75 Worm Assembly—Mountings on the main shaft from quill worm to cone bush including quill worm, pressing worms, reversible pressing worms, spacing collars, taper collars, cone bush, and cone.

2.76 Worm Wheel—One of the gear pairs, each of whose teeth consists of small segment of a helix and mates with worm.

2.77 Worm Wheel Assembly—An assembly of a worm wheel which changes the direction of rotation by a right angle and also plane of rotation. It gives a high reduction ratio of rotation.

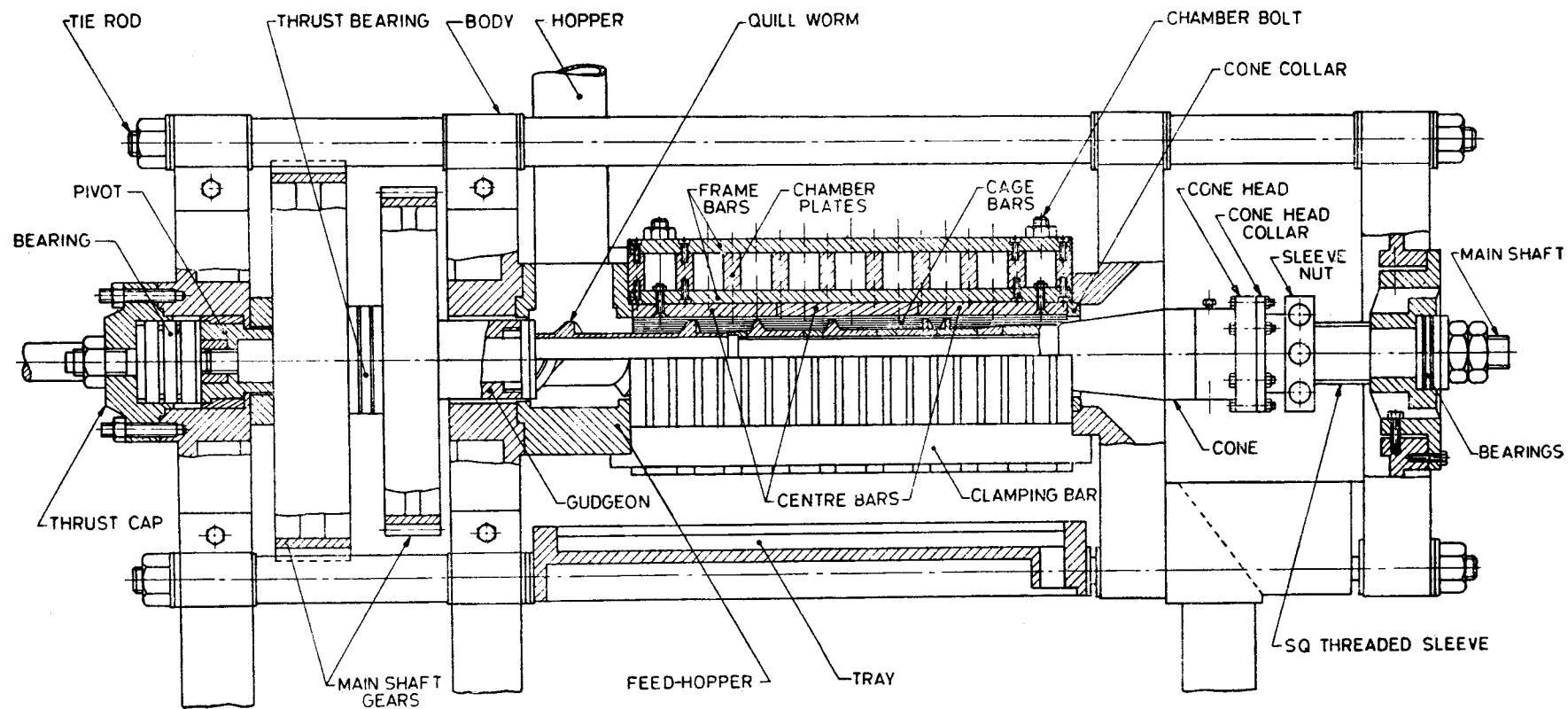


FIG. 1 NOMENCLATURE AND ASSEMBLY OF DOUBLE GEAR OIL EXPELLER

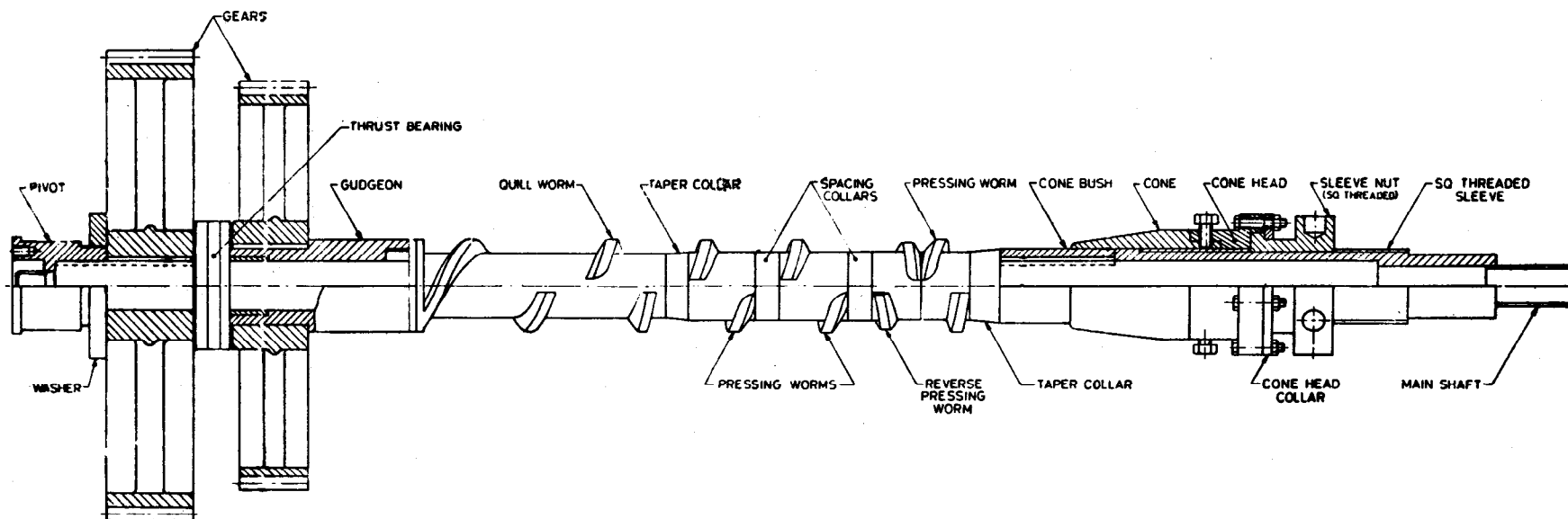


FIG. 2 NOMENCLATURE AND ASSEMBLY OF MAIN SHAFT OF DOUBLE GEAR OIL EXPELLER

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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